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Porsche Brakes and a Story

Ed. Note: The following article was originally written in a letter to Clarence Rutball, who is in charge of PCA technical matters.

I very nearly got killed in a four-car collision one morning because of substandard or distorted brake shoes on my 1959 356A Normal Coupe. The Porsche's roadability and Michelin X tires were the only things that enabled me to avert the accident.

At the very least, I feel my experience should be brought to the attention of all PCA members and the factory.

I took delivery on the car at the factory late last July. The body number is 108 434, the engine number P 75 104. The car is outwardly a 356A but there are several things that do not match the information in the 356A driver's manual or workshop manual. These include the Energit brake linings, the layout of the fuse panel, and a new single front wheel hub nut, a split nut locked with a 6 mm Inhex-head machine screw, that replaces the two nuts-and locking-tab arrangement inherited from VW.

The car had 11,175 miles on it at the time of the near miss. I have had some very light pulling with the brakes at odd times before, but that could always be corrected by the usual simple adjustments. I have never before had the car go out of control without warning as it did that morning.

I splurged on a set of Michelin X tires in February and I believe they saved my life. Because I have to drive hard for business reasons, the Michelins carry 22 lbs. front and 28 lbs. rear.

I am the editor and one of the two regular photographers of the only newspaper on an island 550 sq. mi. in area. I bought the Porsche to get me to the scene of highway accidents, house fires and other spot news 15 to 45 miles away, and get back. When the police call, I have to go, and go like blazes most of the time to get good pictures. The Honolulu dailies sell well here, and local pictures help keep our sales out in front.

At 7:15 A.M. this particularly morning, the police called and said there was a house fire in the hills behind Kalaheo, about 15 miles away and two miles from town on narrow roads I don't know too well. This was also publication day, traditionally the busiest in the newspaper business, so I left the house on a dead run and an empty stomach.

The close call happened about eight miles west of Lihue. I was making 65 or 70 mph true on a two lane hot mix asphalt road, a federal-aid primary highway 24 feet wide, winding through foothills with frequent short straights. It was showering a light drizzle and the pavement was wet, but with very little standing or running water.

I came around a fast right hand bend, not even trying to slide or drift the rear end because of the rain, onto a straight about 1000 feet long. About 300-400 feet away, there were three cars coming toward me, one in my lane passing the other two. I could not gamble that they were all going slow and headed for the right shoulder. Even if the passing car got tucked back in his own lane, I could use the ditching practice. I have had to carry out the same maneuver twice before since getting the car home, but had never lost control during the hard stops.

The shoulder on my right was about 10 feet wide with a high bank on the far edge. I hit the brakes and started what I thought was a safe, gentle turn onto the shoulder. I never got a wheel off the pavement, then or later. The rear end came around hard, the car began to spin clockwise, got almost broadside too, and a bansheee yowl started in the right rear wheel well. I backed off a bit on the brakes and cranked on some left lock. I got past two cars in a reasonably parallel position, the banshee still squalling. When the third car appeared on the port bow, the wheels had begun to take hold again and I was headed almost straight at him. We seemed about two or three lengths away. I braked and swung right again, got clear of him for sure, thought I was out of trouble, then suddenly finished up with a 630 degree (one and three-quarters turns) spin to the right. The other three cars kept on going. I still dont' think a wheel of the Porsche got off the pavement. The hot mix asphalt is an inch or so above the shoulder in most of that section, and the shoulder can be soft and rough if not bumpy. If I'd been on the shoulder, I would have felt it or, at worst, ground-looped in someone else's old rut.

I started out again, shaking a bit, and made a few sharp but not "panic" stops at moderate speeds to check the brakes. No trouble, no obvious pulling, so I lit out for the fire again, holding my speed down to 50-55 as insurance until I got stuck behind a big truck inching up the last hill into Kalaheo.

Nothing about the near-accident has diminished my confidence in the Porsche. If anything, it has gone up. If I had had exactly the same braking failure in an American car, I believe the car would have rolled over, or skidded into the oncoming traffic before I could have taken corrective action. I have seen too many police reports on similar accidents at claimed speeds of 35 to 50 mph, and I once came within inches of rolling a '58 U-drive Chevrolet with power steer-

ing while changing lanes on a divided highway at a true speed of 35 or 40 mph.

I didn't get a chance to adjust the brakes until two days later. My Porsche fixer has insisted I do my own brakes, among other things. (When I came in for the 10,500 miles service, he said, in effect: "There is the grease gun, bud. Wipe the nipples clean first. You know how to use the floor jack and where to put the stands.")

Warren, a very close friend, is maintenance boss here for the Federal Aviation Agency. He sees eye to eye with me on preventive maintenance (as most local mechanics do not). The VW service coupon book was one thing that sold me on VW and Porsche. He runs a part-time foreign car garage and handled the VW new-car coupon service before a local dealer was appointed.

I had been following the adjusting procedure in the 356A manuals to the letter with what we regard as some odd results. For one thing, the front brakes rarely needed tightening, but have usually needed to be slacked off. But, two of the front adjusting screws were up against their stops, and one of the shoes on the left front wheel was dragging hard and noisily on the drum. Its nut was struck and I bent the screwdriver in the tool kit getting it loose. For another, the brakes have been reliable 99 44/100% of the time, but adjusting the brakes did not reduce the pedal travel. The brake drums are slightly out of round, but I have never been trouble by whomping or grabbing in everyday driving.

Early the next afternoon I got some time with the Porsche fixer. We pulled the front drums and had a look. We found that the linings had seated pretty well, but almost all the wear was on about one-quarter of the lining nearest the leading edges. Warren recommended a rubber mallet to tap the shoes loose from the drums before and during adjustment, so the wear would be more even. He thinks the canted lower return springs also have something to do with the uneven wear, and can't understand why Porsche uses them.

We readjusted the brakes, using the mallet all around; he took the front and I the rear. The pedal travel was cut by 50-60% when we finished.

Warren had to go do some work on the garage at his new home site. I started out ahead of him and made some sharp stops where he could see them from behind.

I did not notice anything wrong during the sharp stops, but stopped by his house later and he said the car had pulled to the right. This put the banshee yowl from the right rear wheel in its proper perspective, and we pulled the rear drums right there.

He was looking for a thin oil film on the right rear linings but didn't find it. There were some rather large fuzzy spots which had not seated.

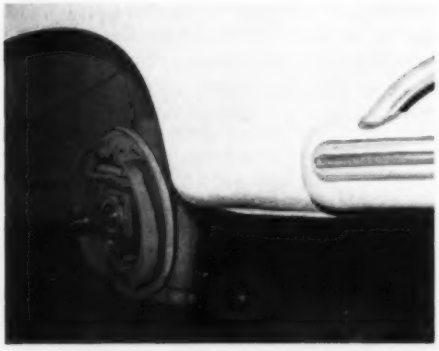
The two shoes on the left rear backing plate were another story. There was far less wear and the shoes were worn on a diagonal pattern. On the worst, the rear shoe, there was a clear dividing line running almost from one outside corner to the inside corner at the other end of the shoe. Except for little tabs at the very ends of the lining, one side of that line was clearly worn and the other was clearly fuzzy and untouched in most places. About half of the lining had never seated at all.

Warren took the rear shoe off and put a micometer on the four corners of the lining. He found .015 in. difference in lining thickness between the opposite corners at the end of the shoe with the least wear, and .020 in. difference between the opposite corners at the end with the most wear.

He thinks the shoes, themselves, are distorted and so do I. (The T shapes on the end view look distorted to the casual eye.) The pictures show the worst shoe while it was on the car, and while we had it off to mike it.

I am going to take some more pictures with a portrait lens and a strobe light the next time the drums come off.

Rear Brake Shoe as Installed on Car, Showing Diagonal Wear Pattern.



Close-up of Diagonal Wear Pattern on Brake Shoe.

Warren is going to fix up an ell bracket to mount on the axle half shaft so that he can measure the variations in lining diameter with a micrometer index gauge.

I think the brake-shoe problem is one more example of the West German subcontractors' seller's-market attitude that Porsche finds themselves stuck with. I dont' think the trouble with the Frendo linings failing to seat was due to the linings at all. My feeling is that the Porsche factory engineers wrongly suspected the linings, and when they made comparative tests with the new Energit linings, special shoes were made up in the Porsche tooling or racing department shop to eliminate all the wild variables they could. My hunch is that the wild variables in the suppliers' production brake shoes caused most of the trouble, and Porsche kept the same shoe supplier when they changed to Energit linings.

The Energit linings are all of a quarter inch thick and look as if they will outlast the engine, considering the treatment they have had. I do not race, because my eyes won't qualify for a competition license. But I wash the car about once a week, sometimes oftener, and then have to dry the brakes out afterward. I usually make a couple of panic stops at the end of the run to prevent brake squeak. When I get time to do a thorough brake job, I take the car out on an unpaved cane field road to check for unevenness, and at those times I'm not gentle on the linings.

Warren is wondering why such terrific linings were not mated to the drums with precision grinding equipment at the factory. So am I. We are also wondering how shoes that appear to be distorted could have gotten past two sets of inspectors at Energit and at the Porsche factory.

As far as I am concerned, my near-miss might shed new light on the crash which killed Larry Riley; there wasn't enough data in the accident report in Pano for me to be sure either way.

Any comments you care to make on this problem will be more than welcome. I have the "western most Porsche in the west" and, as Warren and I get off Kaual only infrequently, we are babes in the Schwarzwald about a lot of things that PCAers in active clubs pick up as a matter of course.

C. J. "Mike" Fern, Jr.
Box 467
Lihue, Kauai, Hawaii

Dear Mike,

The fact that your car is unlike the manual is quite normal. I have a '55 Workshop Manual and a '59 one. Some features of every Porsche that I have examined differ from any of the books, and I have not yet seen any two cars that were exactly the same in all mechanical and electrical details.

The pictures of your brake shoes are good photographically, and the brakes are punk mechanically. It appears that you and your friend, Warren have diagnosed the trouble correctly. The factory should have turned or ground the linings to the same radius as the drum. It would not be difficult for them to have a fixture on a lathe or cylindrical grinder for finishing the assembled linings closely, so that full contact would be soon realized.

The drums are usually somewhat distorted by the wheel. The surface of the wheel that is clamped against the drum by the lug-nuts is not flat, and the five holes are not exactly positioned; so the drum is warped "out-of-round" by the wheel, which is quite a sturdy piece. I do not change my wheels around, nor do I replace them in any but the exact position in which they have been; so that the drums may wear to roundness. The factory should have done a better job on the wheels and studs.

You seem to have plenty of lining on the shoes, so I suggest that you contrive a set-up on a lathe or grinder to re-finish them. The shoes flex slightly under the pressure of brake application, so I think that a radius of about .010 less than the actual drum measurement would be right.

If you lack machine shop facilities, you could fit the linings to the drum by use of prussian blue or red-lead, lightly coating the inside of the drum so as to "spot" the contact areas. With a sharp file or a disc or belt grinder you take down the high spots on the lining until you achieve about 75% contact, which should soon wear in to 90 or 100% area.

When having brakes exposed, I put just a bit of graphite grease on the end of the shoe that fits into the slot of the adjustor, so as to keep it free at that end. Be careful not to use so much grease that it gets on the drum or lining.

It appears that you and Warren have plenty of skill, so I'm sure that you shall get this fixed.

In the meantime, I shall take any opportunity that presents to urge the factory toward better workmanship.

Clarence Rutbell
Technical Chairman

SPARKPLUGS

All 356B models (1600, 1600S, 1600S-90) are being delivered with Bosch sparkplugs in the W225 T1 heat range.

This will come as a shock to you oldtimers, who have been accustomed to using W240 T1 plugs in your Supers. It looks like the factory may be concerned with plug fouling in city driving with the Super and certainly, the S-90.

The factory advises for Supers and S-90s that

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news from the regions

SAN DIEGO REGION has found it necessary to change officers due to business pressures and such. New board of officers has: Paul Madigan, President; Joel Nalve, Vice President; Bill Blanchard, Secretary; while Roland Johson and Keith Ewton will combine on activities.

ARIZONA REGION plans special recognition to all their Dad's by holding a short rally and long picnic on Father's Day. Prexy, Howard Rowe and wife, Bee, are driving a new 1960 Normal Coupe.

NORTHERN NEW JERSEY REGION went Hare and Hounding with their rally in May. They plan a picnic and conours in June. Rankin Davis has been doing a fine job of winning rally silver for this region.

The new GOLDEN GATE REGION has published their first newsletter since becoming a part of PCA . . . a beautiful publication it is, complete with photographs. Their recent 2 x 4 Eight Ball Gymkhana was a success, thanks again to Bud Sutherlein. Now, Bud, what is a 2 x 4 Eight Ball Gymkhana???

Rae Reuss won first in the Capital Court Caper Gymkhana of the MILWAUKEE REGION. Slight changes had to be made in the original course layout as the driver of the "tryout" car found out that one thing his new '60 doesn't do is bend in the middle.

Captain and Marge Thomas, POTOMAC REGION, placed first in the Jersey Devil Rally and the Washington Region SCCA rally, while they did not place in the April Potomac Region PCA Rally. This proves that PCAers and Porsches makes the toughest people to rally against.

EASTERN PENNSYLVANIA REGION PCAers again held Club Hillclimb Championships in conjunction with the 10th annual Duryea Drive Hillclimb, Reading, Pennsylvania. Morrow Decker was the winner in C Production with his Carrera Coupe. Horace Ott was first in club competition and second overall in E Production, while Charlie Beidler was first overall and in club competition in the Normal F Production class.

ROCKY MOUNTAIN REGION has named their news bulletin "Porsche Patter".

L.A. RPM's

Only 27 Porsches delivered in California during January . . . 10 up north and 17 south . . . with 30 dealers up north and 13 in the southland to share them, we can sympathize . . . some blame the shortage on the PCA tour . . . The 8 cars the Californians picked up at the factory last September certainly cannot curtail deliveries in 1960 . . . Have seen 356B's on two showroom floors lately and two dealers advertising delivery now . . . By the way, what ever became of the factory vacation delivery plan? . . . Enjoyed Pano articles by Roland Johnson and Gene Rideout . . . How do you keep the brakes from squealing, Gene? Ours squeal when used easily and pull intermittanlty when used hard . . . The Cal Club put on their usual fine Memorial Weekend races . . . PCAer D. D. Michelmore was nosed out by Lotli . . . Production Porsches took classes F, E and second in D . . . Jack McAfee drove Von Neuman's RSK to a class E first in the over 1500 modified race . . . We hear Don Wester is driving Formula Junior . . . What L. A. PCAer mailed his Road & Track renewal check on the way to the race—then found a R. & T. booth selling subscriptions at a buck discount? . . . and I am going to write J. Bond and ask for my buck! . . . Sports Cars Illustrated had a booth across from them . . . looked like a real price war . . . Late model Porsche owners, check your heater duct tubing for holes worn by parking brake cables.

Jack Case
Los Angeles Region

Bill Sholar helps Del Ankers, of Rodel Productions to "shoot" the Brussels Grand Prix run on the World's Fair Grounds in April. The color film will be available shortly. All photos by Dr. Biesenberger.

Start of the 1st "Course". Bonnier in Factory Car Made Fastest Practice Laps and Had the Pole Position. Clutch "trouble" forced him out after 30 Laps When he was in Second Place.

Hild, the Porsche Race Engineer, Checks Out Lap Times.

Jack Brabham in the Winning Cooper.

The Cars "Splashed" Thru Most of the Second "Course" in a Heavy Downpour. Here They Slow Down Thru the Esses after the Mile Long Down Hill Straight.

S. Moss in the Walker-Porsche Which He Drove to 2nd Place Overall.

Von Hanstein and His Favorite Porsche-Pusher.

A Guy Named "Joe" Wandering Down an Old Italian Road Called Targa Florio.

Windshield Wipers and Motors

The Porsche wiper system has always been a topic for conversation among PCAers. Two PCAers, Rayford Sanders and Gordon Groene, have written the following articles on this subject of interest to all Porsche owners.

Still having windshield wiper trouble? So was I, until a few weeks ago. Here are a few ideas that may solve your problems.

One of the first things I noticed after buying a second hand Porsche was the completely idiodic way the wipers would behave under certain conditions. Being of normal character, most of my under-the-dash investigations occurred during the hardest rain storms. My wife and I have owned a VW since 1956, but I was beginning to find out that a Porsche is different.

In order to acquire more information on the Porsche, I borrowed a manual from a friend and PCAer, and at the same time discovered that he had all of the back issues of Pano from Vol. I, No. 1 to date. While reading all of the back articles, I came across an article by Phil Broderick of Virginia, on repairing the windshield wiper gear box. This was the first indication I had seen that suggested something could be done about my wipers. Also, there was a short article on installing a rheostat in one issue. Even before reading this little tid-bit, I had installed a 4-position heater switch in my system and found it to be very helpful. Right now, I am looking for a good adjustable rheostat such as a TR-3 heater switch. I believe this will work better than the 4-position one.

The first thing I did to improve my wiper system was to throw away the standard arms and blades and install Sears & Roebuck arms and blades. (Wiper Arm 28K6380, $1.79 each. Trico "Rainbow" Blade 28K6378, 10 inches long, $1.35 each.) Besides being readily available, these blades wipe better and do not have those little clips that scratch the soft Porsche windshield.

The adapter rings used with these wiper arms are held in place by one small Allen screw. This is less than satisfactory because they will eventually come loose. This always occurs in the middle of nowhere and when it's raining like the last time you had a flat tire. To eliminate this trouble, drill a hole through the adapter ring and mounting post and insert a locking pin. (90° from the set screw). Chances are you may need to remove this pin some day so don't make it impossible to do so. The pin should be snug enough so that it will have to be forced in or out. I find that welding rods from one-sixteenth to one eighth inch in diameter make excellent pins for this sort of work.

On most Porsches, this adapter ring will fit over the mounting post and leave one-eighth to one-fourth of an inch of the post protruding through the adapter ring. This is fine! Do not fit the adapter ring flush with the top of the post. This will allow the small clip in the wiper arm to catch below the adapter ring and removal of the wiper arm for any reason is then very difficult. By allowing the tip of the post to stick out, the clip in the wiper arm bears against the adapter ring and makes a snug fit. To remove the wiper arm, a firm pressure on the opposite side from the clip will bring it right off.

After installing the new arms and blades, my system still had too much slack in it. Apparently, it had been there for some time since the rubber molding and trim strip were scarred quite badly. Remembering the article by Phil Broderick, my friend and I took apart an old gear box he had stashed away to investigate the possibility of removing any slack in my system. A close examination of the gear box revealed one thing: no pins! We expected to find that a pin through one of the gears had been sheared. What we did find was several teeth missing on the driving gear. Both gears in this gear box appeared to be a shrink fit on their shafts.

For the benefit of those people who have never seen inside a wiper gear box, let me describe one for you. The arm on the outside of the gear box is connected to a small shaft that is supported by two bearings, one on each side of the case. The driving gear is located between these bearings. Actually, the driving gear is not a full gear, but about one-third of a gear. In mesh with the driving gear is a smaller gear. This gear is on the other end of the shaft that the wiper arm mounts on. The ratio between the two gears is about 2 to 1. (Closer to 35 to 15). This means, that for every degree the small arm swings through, the wiper arm will swing through two degrees. It should be mentioned here that some of the older Porsches (?) do not have gear boxes. They are similar to VW in their operation. I'm not so sure that this wasn't the best system to start with!

After opening this gear box and finding both gears to be a shrink fit, (it took a chisel to remove them from their shafts) we decided that probably there were some broken teeth in my gear boxes. The only thing left to do was to order two new gear boxes. I did this by writing a letter to my local distributor. Their reply

brought on some confusion. Porsche wiper systems are made by two different concerns. These concerns are "Bosch" and "S.W.F."

I was informed that they had Bosch gear boxes in stock and S.W.F. on back order, and would I tell them which system I had. I suppose it was asking for too much, but after removing both gear boxes I couldn't find a single identifying mark on either one of them. Finally, by straining my eyeballs around the radio, I found "S.W.F." printed on the framework below the motor. (Bosch uses a symbol that is a circle containing two parallel lines with semi-circles on each end of the lines, the same thing that is on top of your voltage regulator.)

If you have ever taken the wiper gear boxes out of your Porsche, you'll know the position I was in. Twenty minutes of back-breaking work will remove the gear boxes, but getting them back in is another matter. Coupes are much more of a problem than Speedsters or Roadsters. One way is to remove the dash, or at least loosen it some, so that it will drop a few inches. But then this is as much trouble as working upside down. Your best choice is to pull the seats all the way forward, lower the backs, and make yourself comfortable as possible for the next hour or so. If you can keep the gear shift lever out of your ear, all you will get is a headache from being upside down, sore hands from all those items behind the dash, and signals from muscles you didn't know you had.

While we are on the subject of removing and installing the gear boxes, here are a few things that might help. Before undoing the two bolts on the boxes inside the car, remove the water seals and nuts on the outside of the car. This will allow you to catch the gear boxes in your hand after removing the last bolt. These bolts, incidently, are 9 mm in size and an extra-thin-walled box-end wrench will do the best job. When installing the gear boxes, attach the water seals and nuts on the outside first. Turn the nut on the shaft just enough to keep the gear box from falling back into the car. This will give you enough room to put back the small plate that fell out when you took the last bolt out. This plate is about one inch by three inches and is tapped for the bolts that hold the gear box to the frame. The two bolts hold the gear box to the wiper system frame, and the chrome nut on the outside holds both the gear box and the frame to the body of the car. This makes a more rigid system than if all of the items were mounted separately on the body of the car. This plate goes on the top of the mounting frame so that when you put the gear box on the bottom of the frame the tapped plate acts as the nuts for the two bolts. The difficulty here is that you need two hands (or three) where you can hardly get one. You can solve this problem by using double-sticky tape on the plate to hold it in place while you get the gear box and bolts in place. The double-sticky tape used on dash placques is fine, or 3M has a masking tape that sticks on both sides. If you install these plates with this tape, next time you remove the gear boxes the plates will not fall out.

Meanwhile, back at the carport, I decided to call the distributor and see when the S.W.F. gear boxes would be in. As might be expected, it would be two weeks, two months, etc. While I was using the telephone, it was raining!

A quick call to my friend resulted in the loan of another extra gear box. This gear box wasn't in the best shape, but it was at least better than either of mine. It was here that we found out something new. Although his system is S.W.F., the only similarity we found between his gear box and mine was the distance between mounting holes. Everything else was smaller. The small arm on the gear box was exactly one-half the length of mine. The drive shaft was shorter and the diameter of the shaft less than mine, also. Now we really had confusion. Two different systems and two different sizes within one system. And of course, there's nothing in the manual about this.

Since my gear boxes where practically useless in their present condition, I decided to repair them even if it meant making new teeth. When I opened the gear boxes, I found this long lost pin Phil Broderick was talking about. It was on the smaller of the two gears in the box. Unlike the gears in the other S.W.F. gear box, the small gears in these boxes were pinned to the shaft and the large gears were soldered to their shafts. So, apparently, within the S.W.F. systems two different methods have been used to attach the gears. Checking the gears, I found that they were all tight and no teeth were missing. All of the slack in my gear boxes was between the shaft and the small arm that connected to the link rods. A rough measurement showed about five degrees of slack. This meant that the wiper arms, themselves, would have over ten degrees of backlash due to this alone.

At first, this seemed like a simple thing to correct. By using a ball peen hammer, I tightened one arm very securely to its shaft, only to discover that I couldn't turn the shaft when I got through. I had broken the driving gear loose from the shaft and jammed it against the case. At the same time, the shaft was bent beyond repair.

The mistake made on the first gear box was corrected on the second one by using two pieces of hard wood to hold the shaft in the vise. Even so, the driving gear came loose from the shaft. A hole drilled through the gear and shaft for a small piece of 3/32" welding rod proved to be an execellent way to key the gear to the shaft. After measuring the length of the pin, the last eighth of an inch of the pin was flattened so that

it would be a force fit. Care should be taken while drilling this hole so that too tight a fit doesn't result between the gear and the case. One thickness of drawing paper used as an additional washer between the gear and the case while drilling the hole will give you enough clearance. Remove the paper washer before driving the pin in to stay.

While this ball peen method worked very well for the second gear box, you might prefer the method I used on the first gear box while repairing it. I simply brazed the arm and shaft together. Since the first shaft had been ruined, my only choice was to make a new one on the lath. Because the new shaft was made from a much harder steel, peening was not practical. Careful use of the torch allowed the shaft and arm to be brazed together without harming either one. The shaft and arm should be completely out of the case while doing this. All of the earlier cases are made out of an aluminum alloy and would not fair very well under this heat. Above all, do not braze the arm and shaft together with the gear box intact. The grease in the gear box will not take this.

As a precautionary step, it would always be advisable to install a pin in the driving gear should you take the gear box apart, especially if your gear box is the S.W.F. box that already has the smaller gear pinned. The larger gear is only sweated on and comes loose easily.

When assembling the gear box, use a good grade of lubricant such as Lubri-plate or a regular high grade grease with some powered graphite added. Pack an extra amount in the box to insure trouble free operation, but don't go overboard on it. A sealing compound or electrician's tape used at the seams will forestall an unpleasant drip.

The preceding information is based on a limited number of Porsches aavilable for examination. They ranged from 1951 to 1960. While the earlier Porsches do not have gear boxes and the latest Porsches have a gear box of a different design, most of the ones examined had one of the two S.W.F. systems as mentioned before. Since I have not taken a Bosch gear box apart I cannot describe it, but I don't believe it is too different from the S.W.F. system.

The latest gear boxes installed in Porsches appear to have a case made of a bronze (?) alloy. The connection between the arm and drive shaft doesn't look as sturdy as on the older boxes, so this should be checked at the first sign of trouble. Let's hope that an internal change has been made that will end some of these troubles.

As a closing note, what does cause all of these troubles? For one thing, the design isn't the best in the world. (Of course no automobile is perfect, but I like to think of Porsche being that way. It is a shame that a $4,000 automobile has to be plagued with such "minor" difficulties.) Then there's running the wipers on a dry windshield. This isn't good for any system, especially a Porsche's. This slow running is a strain on the whole system. And just opposite to that is the speed at which the wipers run at other times. The sudden reversal of the blades at high speeds causes excessive loads to be applied to the gear box. (A rheostat is helpful here.) And last but not least, is the sweep angle. On my car, as with many others, the blades touch the molding on both sides of the sweep. This is quite a shock load, especially when the blades are moving at high speeds. Surely there must be some way to adjust this.

I would be very interested in knowing if anyone has succeeded in adjusting the connecting links to change the sweep angle. The geometry of the system looks as thought it will allow a small amount of angular adjustment. So far, I haven't gotten around to it, but one of these Sunday afternoons I'm going to try. My wipers have been working so well lately, I hate to touch them.

Rayford R. Sanders
Auburn, Alabama

How are You Fixed for Blades?

In recent issues, many PCAers have complained about the windshield wipers. The following are a few improvements I've incorporated into my '59 1600 Super in the interests of better viewing.

Here is the rub—the wipers wouldn't stop when turned off. A reader asked in a past issue what the fourth wire is for. This is used to operate a dynamic brake which grounds the armature as the motor goes through the park cycle if the switch is in the "off" position.

If the wipers fail to stop when turned off, a simple test is to remove the center wire from the terminal strip on the wiper motor (excluding the ground wire) and attach the standard 6-volt timing light between this terminal and ground. During operation of the wiper, as it passes the "park" positions, the lamp should flash. If it doesn't, the contact should be removed and cleaned.

If the light does flash, test the end of the lead that was removed for ground when the switch is off. If this lead is not grounded there is either a faulty switch or a loose or broken connection in this wire.

To remove the contacts, take out the two small screws on the cover (this can be done easily without removing the motor) and the contacts can be removed through the opening. The usual reason for fouled contacts is that grease works through the small plunger which actuates the

contacts. It would be advisable, while the contacts are out, to remove the plunger carefully with tweezers and clean it and the contact housing thoroughly. So much for your parking problems.

The next improvement concerns wiper speed. In light drizzle conditions, the wipers run much too fast, promoting rapid wear on gear boxes and windshield glass. This can be cured by installing an Ohmite 2-Ohm 25-Watt rheostat (model H series A or equivalent).

This can be installed to the left of the ignition switch where it can be operated at the same time the wipers are. This provides control from an absolute minimum to full speed. The control is installed simply by drilling a ⅜ inch hole one and five-eighths inches to the left of the center of the ignition switch and one inch from the bottom edge of the instrument panel.

To install the rheostat, it will be necessary to remove the rubber coupling on the left side defroster duct. Removing and replacing this hose is the hardest part of the job.

Theoretically, a 50-watt rheostat should be used, however, the physical dimensions of this position are too small. In service, the 25-watt seems to have sufficient cooling to be completely reliable. Pointers are readily available in white to match the rest of your panel, or black if you're one of the fortunate few.

Before the rheostat is installed, attach a 4 inch piece of suitable wire to the center terminal. Under the panel, find the black wire with the purple tracer leading from the accessory plug. Cut this wire and strip the end about one inch from the socket. To this end, attach the wire you have soldered to the rheostat with an AMP connector and solder, then strip the other end of the wire and attach to the left (looking from the back side) terminal of the rheostat. Then install the rheostat in the usual manner. It's not necessary to remove the battery leads while doing this, but by all means, remove the windshield wiper fuse which disable this whole circuit.

At least once a year, preferably in the fall, the windshield wiper motor gear box and the wiper arm gear boxes should be removed, opened, thoroughly cleaned, and repacked with #630 AA Lubriplate. If you've never opened the wiper arm gear boxes, you'll need six 6-32 x ½ inch machine screws with nuts and washers. These are the only parts required.

On my own gear boxes there was not sufficient grease to keep the shaft running through to the outside lubricated. One of them was badly scored and caused a loud squeal.

For replacement wiper blades, I use Anco-11 inch Clear-Flex refills, stock #600. These can be removed from the metal strip they come in and installed in the Porsche arms quite easily. It will be necessary to cut off about half an inch. These blades are very soft and conform readily to the curve of the glass.

A few more DON'TS:

1. NEVER run the wipers on dry glass
2. Always use the washers frequently if you're running on sloppy pavement where abrasive particles are deposited on the windshield.
3. NEVER turn on the wipers if you think the blades are frozen to the windshield. Break them loose by hand first. This is the major cause of burned-out motors because the motor cannot be turned off after it takes up the slack in the mechanism and leaves the "park" position. However, if you should goof, you may save the motor by quickly engaging the cigarette lighter, which should blow the fuse. The best cure would be to install a separate fuse for the wipers, rated at 19 amps, so the fuse would blow before the motor is damaged. Of course, the rheostat will solve this problem too—by turning it all the way down, it will be impossible to burn out the motor.

If you have trouble with windshield washers, be sure to check the filter screen in the reservoir. Mine was completely corroded. The only thing I've ever used is Trico fluid, diluted properly. I modified this screen to give more filtering area.

If you've ever tried to hold a blade in your hand and, with your arm out the window at 70 miles per hour, try to run it across the glass, you'll realize that Ferry's gay blades shouldn't be sold short after all!

Gordon Groene
Champaign, Illinois

for sale

Spyder 550 1500 RS #62. Excellent condition and reliable. Never wrecked. Fred W. Schraegle, 1101 Cleo St., Lansing 15, Michigan.

'59 1600N Coupe, red, Becker radio, 12,000 miles. Robert Wienhold, Long Prairie, Minn.

'59, red and black Porsche Karmann-Ghia Coupe. '59 Porsche brakes on front wheels, 1600 N engine. Will sell engine and brakes separately if desired. Gordon Groene, 804 West Church Street, Champaign, Ill.

One Thomas Rally Computer—$2,500. Attachments include 1958 1600N Coupe with complete set of Koni shocks. Lynn Sholar, 10 Alexis Rd., Woodbridge, Va.

Full Tonneau Cover for 356A Cabriolet. Black. Brand New from Stuttgart, with box of Snaps, $30. Also one Carburetor, Solex PBI for 1100, 1300, 1500. Brand New plus 2 Gasket Kits, only $25. Wally Storch, 5 Comet Lane, Levittown, N.Y., Tel: OV 1-3851.

letters to the editor

where do we go from here?
(continued)

The February '60 Pano contained a letter to the editor entitled, "Where Do We Go From Here?" This letter is, without a doubt, one of the best ever written for Pano.

PCA started as an organization of owners and lovers of Porsches; and its growth, complexity, and development have paralled that of the Porsche itself. It has become an international force, both in its interests and in the potential power it holds. Now we are as complex in our interests and motives as the factory itself. The one thing we all share in common is a love and respect for the Porsche.

Some are mainly interested in the Porsche in racing competition. Others are long gone on rallying. Still others get their main satisfaction with the technical considerations and problems. Last but not least, is the man who isn't terribly interested in any of the above three, but just appreciates and loves to drive the car for what it is. All of the above are good enough reasons for belonging to PCA.

Mrs. Sholar has compiled some very worthwhile facts concerning the "Uniform Vehicle Code", the great variance of laws governing driving in the various states, accident statistics, etc. John Q. Motorist must try and conform to an incongruous and uncoordinated mixed up mess of regulations governing driving in our Fair Land.

As owners of fine vehicles, one of the goals of our organization (this includes all of us) should be to help promote in every way uniform national driving laws, better roads, proper and realistic licensing of drivers, mechanical inspection of all cars, and a sensile and realistic approach to speed. A Porsche well driven gains respect for both the car and the driver in the eyes of sensible people. A Porsche driven badly not only reflects upon the driver, but also often upon the car, too, in the eyes of many.

The three things that probably irritate the average PCAer most are as follows: To be called or classed as a "hot rodder"; to be dragged and put in jeopardy on the highway by some idiot in Detroit and sometimes even Foreign Iron; and to be asked by impolite and ignorant citizens, "What did that thing cost?" As J. P. Morgan once said, "If you have to ask the price, it isn't for you". We cannot completely cure the above irritations, but proper conduct and intelligent answers can help to some degree. The driver of a Porsche who, by his actions, continually brings criticism of the car is no friend of PCA and has no place in it. In competition, occasional accidents are bound to occur, even to the Porsche; but on the highway serious Porsche accidents should be uncommon, at least among PCAers.

Both on a National and Regional level, club activities should support the above goals, and then apportion their other activities, depending upon the main interests of the members. No one interest, such as sport or technical, should completely dominate all activities. The social aspects and the new friends it brings are important benefits of any region.

Last, but not least, is the effect of our organized efforts to improve the National service organization for our cars. Just criticisms and suggestions can also help the factory, especially if they go through our National PCA office.

Mrs. Sholar's letter should bring in many letters with thoughts, reflections, and suggestions. If it doesn't, something is wrong with PCA. Let's hear from you.

"Old Doc" Rideout

They Never Die!

I'm still driving the same old relic, a '54 1500 Coupe with over 75,000 miles on it and no major overhaul yet. In fact, it's running better now than it has ever done before. Just won a local Economy run with it, defeating VWs, MGs, Sunbeams, etc. both overall and by percentage, with 51.1 mpg. Last year, we won it with 58.8 mph, but that was a slower average and easier course. Both time we had higher actual mileage. And she ran swell!

Charlie Cooper
P.O. Box 2567
Fort Myers Beach, Florida

drifted from page 5

when they are subjected to great strain at high temperatures, W240 T1 plugs may be used. This would, of course, include racing.

With the S-90 on long highway trips at high speed, we would be a little skeptical about keeping the W225 T1 plugs in and would make it our business to install the W240 T1.

The going to the colder sparkplug will prevent burning up of the plugs and the resulting harmful detonation which destroys engines, including Porsche engines.

Compensating Springs

The S.C.C.A. has made the following announcement:

Porsche—all 356A and B Models—add under approved optional equipment, "Compensating Spring (rear axle)". This is the Porsche built part only, and NOT substitute accessories such as the Empi spring.

This, of course, means the Empi camber compensator cannot be use on any Porsche in SCCA events.

The factory has made available a rear axle compensator spring kit for installation on all 356A and B models with the type 644, 716 and 741 (tunnel housing). The kit lists for approximately $77.20 here in the States. Labor to install the kit will run around $30.00.

The factory says if you originally order a 356B from the factory with a request for the compensating spring (it is standard only on the Super 90) it will be about $34.55 extra.

The factory kit includes two 23 mm diameter torsion bars, spare part 695.333.102.00. These replace the 24 mm diameter torsion bars originally installed in the car.

The following are the radius arm adjustments used with the 23 mm diameter torsion bars and the compensating spring:

Vehicle Type 356A	Coupe, Cabriolet Hardtop	Roadster
1600, 1600S	12°30′	10°30′
Carrera Deluxe	14°30′	12°30′
Carrera GT	10°	9°
Vehicle Type 356B	**Coupe, Cabriolet Hardtop**	**Roadster**
1600, 1600S	15°30′	13°30′

The adjustment of the radius arms to the proper specifications is where most of the labor of installing the kit is involved.

There is also different adjustment on the bar mounts themselves, for Carreras and the 1600, 1600S and 1600S-90. The Carreras take the lower castle nut setting.

It doesn't take a mastermind to realize that a lot more thought in regards to "suspension tuning" has gone into the factory kit than the Empi bar.

When a factory spring or an Empi bar is installed with 24 mm diameter torsion bars, you immediately become aware of a lot stiffer feeling in the rear suspension. This is the reason for the "softer" 23 mm torsion bars in the factory kit.

Bill Barnard writes in this issue of his experience with the Empi bar and his decambered Coupe. This same condition had been noticed here also, and the solution was again bending the Empi bar.

We take no sides on which spring is the one to install. We do consider the factory spring to be engineered with more specific Porsche thought, and it is SCCA approved. On the other hand, there is a big price difference between the two springs.

Porsche Hobby Shop
C. Brown's

Empi and Decambered

After seeing the new 356B modification, I immediately installed one of Empi's gadgets, only to find that my Super Coupe, already decambered in the rear, gave definite indications of better handling without the extra spring. After many measurements an rather extensive tests in the form of high speed trips across Nevada, it became apparent that the decambered axles and spring were fighting each other. With the axles decambered, the arc of the compensating spring was such that the spring itself tended to decrease the effect of decambering. This was particularly noticeable in heavy wind.

So, after removing the spring and retesting the handling qualities, I came up with a solution which has proved very satisfactory. The arc of the spring—inverted on a bench, was found to be 3 inches high at the center. Under the car, the equivalent measurement was 5 inches. Then the spring was heated at the center and reformed to give the 5 inch height at the center (spring inverted again). This amount will vary with the individual Porsche, but by trial and error, the correct amount seems to be that which will put the spring in very slight compression when fitted with the wheels on the ground in normal, loaded position.

Now, the handling of der Porsche is much improved, the combination being better than either spring or decambering separately. And, contrary to some factory comments, there has been, in 6000 miles, no adverse effects of wear on the 356A front transmission mounts. Also, though we all realize that heating a leaf spring is a poor approach, there has been no change in the action of the spring under varying load conditions; nor has the arc of the spring changed after periods of compression resulting from the car being on a hoist with the axles free.

Lt. W. H. Barnard, USMC
Ft. Sill, Oklahoma

Photo Credits

Our Cover Photo from Curtis Hoxter Inc., shows Joachim Bonnier being congratulated by Edgar Barth and Huschke von Hanstein at the finish of the big Porsche Victory at Targa Florio.

Photo credits this issue go to Mike Fern, Jr., Curtis J. Hoxter and Dr. Hortolf Biesenberger . . . Many THANKS!

welcome, new members

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PLEASE DRIVE CAREFULLY . . . THE CAR YOU SAVE MAY BE YOUR PORSCHE!

pca personality

Joseph F. Wenckus

Joe, the head of an electronics research and development laboratory, has spent all of his 32 years in the New England area, having been born in Cambridge, Massachusetts.

He bought his first Porsche in 1952, starting with a Super Coupe (crashbox), then graduated to a '56 Normal Coupe, and is now the happy owner of a '60 Normal Cabriolet which he picked up on last year's Treffen.

He can rightfully claim to be one of the original Porsche pushers in the New England area, and has covered more than 160,000 miles at the wheel of a Porsche while being an ardent do-it yourselfer as far as maintenance and repairs are concerned.

Joe is a charter member of the Northeast Region, the present President of this region (second term) and the editor of the regional publication, Northeast News.

PCA is proud to have people such as you, Joe Wenckus, as members and leaders of its regions.

ENGLISH

It seems that while up in Santa Rosa at the races Harry Weber took a Porsche out on the back roads to demonstrate how a make a perfect four wheel drift. Up comes a beautiful curve and Harry put on perfect demonstration of drifting, the only problem being that coming around the curve the other way was a police car which Harry only missed by a ¼ of an inch. Of course, the cop wheels around and lets go with red light, siren and all. Harry pulls over, jumps out of the car and says, "nien ge-speaken the English" and the cop, livid with rage, grabs ahold of Harry and replies, "Listen, buddy, by the time you get out of jail you'll speak English plenty good". And he wasn't kidding, it took friends 4 hours to get Harry out of the local pokey.

Golden Gate Region Newletter

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KENSINGTON PRODUCTS CORPORATION

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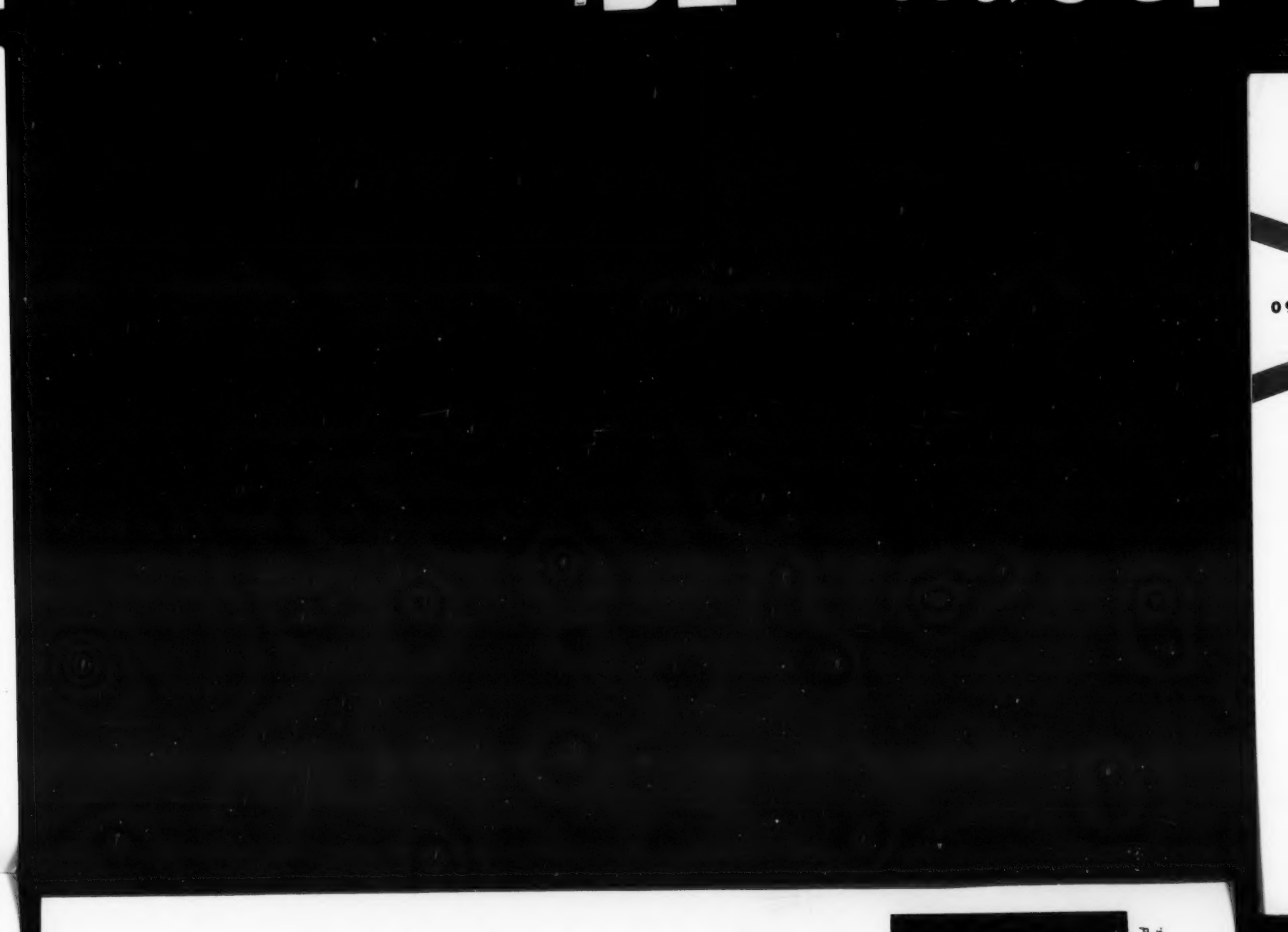
New York 21, N. Y.
Telephone:
JUdson 2-9343
Dealers throughout the country

Porsche prices for each shock absorber are:

Type 356	$23.30 Front and Rear
Type 356A (includes GT)	$24.46 Front and Rear
Type 550 RS	$25.86 Front — $29.95 Rear
Type 718 RS	$29.27 Front — $29.95 Rear

We will gladly send further information

* *KONIS are fitted as standard equipment for the Porsche, Ferrari, Maserati and Cunningham racing teams and Porsche Super, Carrera, Super 90 and Spyder cars.*